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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,624	07/03/2003	Takashi Mizuno	09792909-5653	4347

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EXAMINER

DANG, TRUNG Q

ART UNIT PAPER NUMBER

2823

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/613,624	Applicant(s) MIZUNO ET AL.	
	Examiner Trung Dang	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.  
 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-10 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 03 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:  
         1. ☒ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiely et al. (US 5,953,355) in view of Uemura et al. of record.

Kiely teaches method of manufacturing a semiconductor device including a laser chip and a base having the laser chip mounted thereon, including the step of: providing an assembly 10 with the laser chip 20 mounted on the base 12, the assembly including a wire-bonded wiring 22, 24 (see Fig. 1).

Kiely differs from the claims in not disclosing that the assembly having the laser chips mounted on the base is irradiated with an energy beam having a shorter wavelength than an oscillation wavelength of the laser chip to remove adherent from the laser chip and the base.

Uemura et al. teach that when a semiconductor including laser chip is

irradiated with an energy beam having a shorter wavelength than an oscillation wavelength of the laser chip, organic contaminants adhere on the laser chip is removed. Furthermore, after the wafer is cut into chips, the chips are irradiated with UV rays, hence the reliability of ball bonding is improved (paragraph [0021], paragraph [0070]). See paragraph [0031] for the group III nitride compound semiconductor device includes a laser diode, i.e, the semiconductor chip is a laser chip. Also see paragraph and [0017] for the irradiating UV ray having wavelength of 172 nm, which is a shorter wavelength than an oscillation wavelength of the laser chip (Xe excimer laser lamp light generates UV ray having wavelength of 172 nm).

The subject matter as a whole would have been obvious to one of ordinary skill in the art to modify the teaching of Kiely by irradiating the laser chip **20** mounted on the base **12** depicted in Fig. 1 with UV ray as suggested by Uemura because the UV ray irradiating would remove contaminations adhere on the laser chip therefore preserving the long life as well as the light emission efficiency of the device. Furthermore, in light of Uemura's suggestion that the UV ray irradiating also improves the reliability of ball bonding, it is reasonably expected that such irradiation would also improve the bonding of wires **22**, **24** to the chip and the base. Note that when the laser chip mounted on the base is irradiated, the

base is also irradiated.

For claim 2, it is obvious that semiconductor devices are sealed off from the surrounding environment after manufacture in order to protect and to put the devices in practical use. Such practice is conventional as shown in Fig. 1, wherein laser chip 20 are sealed off by surround can 14 and cap 16.

For claim 3, see paragraph [0030].

For claim 4, it is inherent that the laser chip of Uemura et al. would have an oscillation wavelength of 550 nm or less because, like the present invention, it is manufactured using nitride semiconductor layers.

For claim 5, excimer lamp in the reference is a Xe excimer laser lamp light that generates UV ray having wavelength of 172 nm.

As for claims 6, although Uemura et al. disclose an energy beam (UV ray) treatment method, Uemura et al. also disclose that conventional oxygen plasma treatment method is feasible but the oxygen plasma treatment requires controlling the treatment time exactly (paragraph [0021]). The subject matter as a whole would have been obvious to one of ordinary skill in the art to irradiate the base having a laser chip mounted thereon with oxygen plasma because it is recognized that irradiating the chip with oxygen plasma is also applicable but merely requires exact control of the irradiation time.

For claims 7-10, see the above references to claims 2-5, respectively.

***Response to Arguments***

3. Applicant's arguments filed 04/04/05 with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

In the Remarks, applicants argue that Uemura fails to disclose or suggest irradiating a laser chip and body after bonding a wire. Applicants' argument is found unpersuasive for the following reason:

It is Kiely's reference, not Uemura, that is relied in the rejection to show the laser chip **20** mounted on the base **12** and bonding wires **22, 24**. The deficiency in Kiely is cured the teaching of Uemura as mentioned in the rejection.

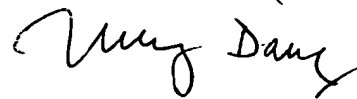
Applicants' argument is therefore largely directed to what the cited references teach individually where the rejection, as here, is based on a combination of references. However, it is axiomatic that one cannot show nonobviousness by attacking references individually. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is

571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Trung Dang  
Primary Examiner  
Art Unit 2823

04/15/05